

An aerial photograph of a dense, lush green forest. A light-colored, paved road winds through the trees in a series of curves. The text is overlaid on the center of the image.

ZWEIBRÜCKEN FASHION OUTLET CLIMATE-RELATED RISK ASSESSMENT

VIA OUTLETS

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QUALITY CONTROL

Client Name	VIA Outlets	Document Ref
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1	05/07/2024	Delivery to Client
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EU TAXONOMY COMPLIANCE

Category	Severity	Climate-related hazards	Materiality	Exposure data source
Temperature-related	Chronic	Changing temperature (Air, Freshwater, Marine water)	Medium materiality	Jupiter ClimateScore Global
		Heat Stress	Low materiality	Jupiter ClimateScore Global
		Temperature variability	High materiality	Jupiter ClimateScore Global
		Permafrost thawing	No materiality	Alfred-Wegener-Institut eventfive
	Acute	Heat wave	Low materiality	Jupiter ClimateScore Global
		Cold wave / frost	High materiality	Jupiter ClimateScore Global
		Wildfire	Low materiality	Jupiter ClimateScore Global
Wind-related	Chronic	Changing wind patterns	Low materiality	Jupiter ClimateScore Global
	Acute	Cyclone / hurricane / Typhoon	Low materiality	Jupiter ClimateScore Global
		Storm (including blizzards, dust and sandstorms)	Low materiality	Jupiter ClimateScore Global
		Tornado	Low materiality	Jupiter ClimateScore Global
Water-related	Chronic	Changing precipitation patterns and type (snow/ice, hail, rain)	Low materiality	Jupiter ClimateScore Global
		Precipitation or hydrological variability	Low materiality	Jupiter ClimateScore Global
		Ocean acidification	No materiality	Copernicus Marine Service
		Saline intrusion	No materiality	European Environment Agency
		Sea level rise	No materiality	Jupiter ClimateScore Global
		Water stress	Low materiality	Jupiter ClimateScore Global
	Acute	Drought	Low materiality	Jupiter ClimateScore Global
		Heavy precipitation (snow/ice, hail, rain)	Low materiality	Jupiter ClimateScore Global
		Flood (coastal, fluvial, pluvial, ground water)	Low materiality	Jupiter ClimateScore Global
		Glacial lake outburst	No materiality	European Environment Agency
Solid mass-related	Chronic	Coastal erosion	No materiality	Global Assessment of Human – Induced Soil Degradation
		Soil degradation	Low materiality	World Atlas of Desertification
		Soil erosion	Low materiality	European Environment Agency
		Solifluction	No materiality	European Environment Agency
	Acute	Avalanche	No materiality	European Environment Agency
		Earthquake / Landslide	Low materiality	European Environment Agency
		Subsidence	Low materiality	World Atlas of Desertification

Following the analyses undertaken, the asset is aligned with the EU Taxonomy criteria for DNSH to climate change adaptation¹ – thereby contributing to its overall alignment under the climate change mitigation objective (Activity 7.7. Acquisition and ownership of real estate).

The materiality rating of hazards is as in the present day. Low materiality hazards have projections of increases to “medium” or higher exposures in the medium or long term, whilst very low materiality hazards have no exposure projections according the ClimateScore Global projections through to the end of the century.

¹ The physical climate risks that are material to the building have been identified by performing a robust climate risk and vulnerability assessment with the following steps:

1. Identification of physical climate risks from list in Annex and how they may affect the building over its expected lifetime
2. If risks have been identified in (1), conduct a climate risk and vulnerability assessment to assess the materiality of those risks for the building
3. Identify adaptation solutions that can reduce identified climate risks

BREEAM IN-USE COMPLIANCE



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BIU Credit	Question	Credits achieved through the Longevity Climate Risk Report
Part 1: RSL 01 Flood Risk Assessment	If a flood risk assessment (FRA) has been carried out, what was its scope and which flood risk level was assigned to the asset?	The number of credits gained here depends on the findings in the report. Since Fluvial and Tidal flooding hazards are less than Medium overall risk, 3 credits are attained . Please note that the exemplary credit is achieved from this report but scored separately. Therefore, the total score will be the number of credits above plus the one exemplary credit (1% available).
Part 1: RSL 03 Natural Hazard Risk Assessment	Has a risk assessment been carried out to understand an asset's exposure to current Natural Hazards?	Whilst Longevity Partners can provide the Natural Hazard risk assessment, it is up to the client to make emergency plans for the hazard (cold) identified as posing a risk to the asset. Only then will the 2 credits be achieved.
Part 2: RSL 06 Emergency plans and climate-related physical risks	What is included within the scope of the Emergency plans?	Please note that Longevity Partners can help advise on how to integrate climate-related risks into your existing emergency plan to target the exemplary credit (1% available) within the report and assist in integrating appropriate phrasing within the plan itself for an additional cost. This is an <i>additional service</i> to this report.
	Has the asset been assessed for climate-related physical risks?	3 credits will be achieved from this asset level report ('Yes, and the risks posed to the asset value and the community have been identified').
Part 2: RSL 07 and RSL 08 Climate-related transition risks and opportunities and Social risks and opportunities	Has the asset been assessed for exposure to climate-related transition risks and opportunities through a risk assessment process?	4 credits are attainable for each of RSL 07 and 08 out of this report, but only if the client are willing to incorporate this onto the website of the asset itself to make it externally disclosed. Longevity Partners can again advise on the wording for this disclosure. Full TCFD reporting, however, is not included within this scope of work but can certainly be provided at an additional cost.
	Has the asset been assessed for exposure to social risks and opportunities through and risk assessment process?	2 credits are available for each of RSL 07 and RSL 08 if this report is not externally disclosed.

Longevity Partners completed this assessment. A relevant, multi-disciplinary energy and sustainability consultancy who specialise in providing strategic guidance and compliance support.

Most natural hazard (including flooding) data comes from ClimateScore Global, which is a science-based platform powered by Jupiter. Subsidence data comes from the European Ground Motion Service (Copernicus), which provides consistent and reliable information regarding natural and anthropogenic ground motion, with millimetre accuracy.



GRESB COMPLIANCE



GRESB Risk Category	Risk Criteria	Asset Risk
Does the entity have a systematic process for identifying physical risks that could have a material financial impact on the entity?	Acute hazards	The asset location has material exposure to cold weather-related hazards.
	Chronic stressors	The centre has no material exposure to any of the GRESB-defined chronic stressors.
The entity's process for prioritizing physical risks	This is the entity's preference. It is recommended that risks are prioritised by severity in the short term under the least stringent climate scenario.	
How materiality determinations are made for such risks	In this assessment, materiality is determined by any hazard that shows a risk of moderate to extreme under each respective climate scenario and time horizon.	
Does the entity have a systematic process for the assessment of material financial impact from physical climate risks on the business and/or financial planning of the entity?	Reference Page 23 of this report which discusses the financial exposure to the direct and indirect physical risk impacts.	

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INTRODUCTION

PROJECT OVERVIEW

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This document presents a Climate Risk Assessment for Zweibrücken Fashion Outlet. The scope of this assessment is as follows:

1. Exposure to physical perils as well as transition risks:
 - Physical Exposure: Assessment of exposure of the asset to different physical perils over different temporal and climate horizons. These include heat, precipitation, drought, flood (coastal, fluvial and pluvial), wildfire, wind, storm (dust and sand), tornado, cold, hail, subsidence, soil erosion, soil degradation, solifluction, volcano, earthquake, landslide, avalanche, tsunami, glacial lake outburst, blizzard, permafrost thawing, ocean acidification, saline intrusion and coastal erosion.
 - Transition Exposure: Examining exposure to different types of relevant legislations, technologies, market conditions and reputational risk.
2. Vulnerability assessment
 - Based on the centre's features and the policies in place. This determined the asset's overall risk to each hazard.
3. Financial impact assessment:
 - The implications of each relevant risk is examined and estimations for capital expenditures of the proposed risk reduction measures are provided.

Longevity have conducted desk-based climate-related physical risk exposure assessments using high resolution data to screen the assets for their exposure to key risk indicators under future climate and temporal scenarios until 2080, including coastal, fluvial and pluvial flooding.

A complimentary summary report has been provided alongside this executive summary which provides further detail on the process of risk identification, analysis and recommendations to improve climate resilience. These reports are compliant with EU taxonomy; TCFD reporting; BREEAM in Use certification credits RSL01, RSL03, RSL06 and RSL07; and GRESB benchmarking RM6.1, 6.2, 6.3 and 6.4.

BACKGROUND

Asset Background

Location: Londoner Bogen 10 - 90, 66482
Zweibrücken, Germany

Asset Type: Fashion Outlet Centre

Construction Year: 2001 to 2010


Gross Internal Area: 30,294m²

Near to: Zweibrücken, Saarbrücken

Climate Background (Zweibrücken, Germany)

Continental climate;

- Cool winters and warm, wet summers;
- Extreme weather conditions becoming more common;
- 2023 was the warmest year on record in Germany (since 1881);
- The average annual precipitation in Zweibrücken between 1991 and 2021 was 915mm;
- Summers are predicted to become warmer and drier; winters are predicted to become milder and wetter.



Zweibrücken
Fashion Outlet

METHODOLOGY

Methodology Overview

This risk identification and quantification process involves an analysis of climate-related physical risks at the asset level. The analyses of the risk assessments consist of the following components:

1. Exposure - An evaluation of the likelihood of the peril occurring at the site's given location.
2. Vulnerability (determined by data provided by client) - An analysis of the vulnerability of the building to the risks of climate change. This analysis is expressed as a combination of the sensitivity and adaptive capacity. This executive summary report is not inclusive of all assessed vulnerable and resilient features and policies of the asset; full analysis is provided in the appendix report.

Sensitivity	This determines the susceptibility of the site to the identified perils. These are usually elements of the building or its surrounding areas which would not be easily adaptable nor controllable (such as topography, building height etc.).
Adaptive Capacity	This evaluates features of the building and its management, such as internal and external installations and policies that could be altered to cope with said risks and consequently render the site more resilient (such as vegetation, rainwater harvesting etc.).

The table on the right illustrates the key used to quantify exposure, sensitivity, adaptive capacity and overall risk rating. This key also adapts the scoring system provided by Jupiter ClimateScore Global to provide a uniform rating for this report.

Risk Rating	Risk Level
0 - 20	LOWEST
20 - 40	LOW
40 - 60	MEDIUM
60 - 80	HIGH
80 - 100	HIGHEST

Physical Risk Methodology

The risk assessment uses high resolution climate data from Jupiter ClimateScore Global to determine the likelihood of occurrence and severity, of seven climate-related hazards at each asset's given location. The data is available under different socioeconomic pathway (SSP) scenarios across several timescales (1995 baseline, 2020 present, 2030, 2050 and 2080). The scenarios include:

- SSP1-2.6 (1.8°C): Sustainability to Middle of the Road (low to medium challenges to mitigation and adaptation)
- SSP2-4.5 (2.7°C): Regional Rivalry and Inequality (high challenges to mitigation and adaptation or; low challenges to mitigation, high challenges to adaptation)
- SSP5-8.5 (4.4°C): Fossil-fuelled Development (high challenges to mitigation, low challenges to adaptation)

ClimateScore Global measures risks* on a scale from 0 (lowest) to 100 (highest). Metrics for each peril have been outlined for only the hazards which are considered material (for scores greater than 40).

**Exposure sources for risks not covered within Jupiter ClimateScore Global have been provided in Table 2 of the Appendix Report.*

Longevity recommends adapting an asset to the average worst-case scenario "SSP5-8.5" to be as resilient as possible and protect the asset from potential future financial and physical risks.

METHODOLOGY

Transition Risk Methodology

The exposure to climate-related transition risks is broken down into two methods of analysis per type of transition risk. The interrelated nature of market and technology risks has resulted in these two areas of risk being merged for the purpose of this analysis.

Risk	Methodology
Policy and Legislation	A review of local, regional or national shifts in governmental climate-related policies and regulations that may cause adverse effects on an asset. A risk score is provided based on its perceived or potential impact on the asset. For example, an asset located within a country with stringent legislation regarding climate change adaptation and resilience, energy consumption, and transparency and reporting would be considered a high-risk scenario.
Market Technology	The CRREM analysis was conducted for both risks. This uses the energy consumption data of the asset to project its carbon emissions performance and its compliance with decarbonisation targets until 2050. The CRREM tool considers all types of energy consumption, ranging from fossil fuels to renewables, under different asset classifications. For technology risk, the policy exposure was also taken into consideration.
Reputation	The reputation risk exposure posed by changing consumer preferences and stakeholder concern and feedback was assessed. Exposure of the asset to these risks was largely driven by the type of sector the asset belongs to, and the trends analysed within it.

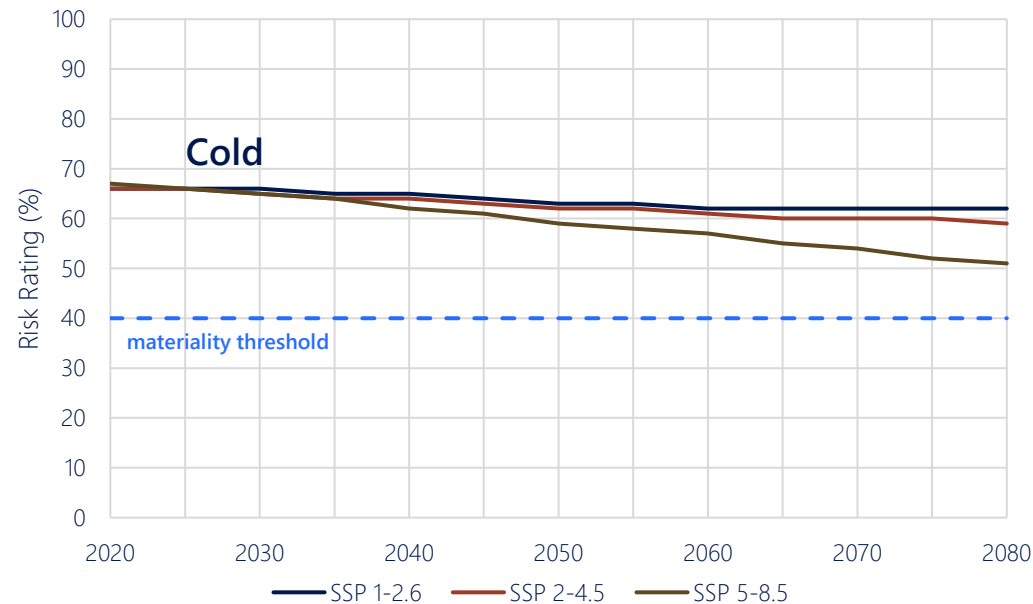
Financial Risk Assessment

A review of the overall risks posed by climate change determines their overall impact on key financial areas that would affect asset continuity in the future. This is evaluated based on the culmination of the aforementioned risk assessments undertaken, referencing the most pressing time period (e.g., present day) and extreme climate scenario (SSP5-8.5 for physical and social risks or 1.5°C for transition or social risks). This is then expressed as a qualitative scale (low, medium, high) to provide an indication of the financial impacts that could be caused to the business by these risks. Financial metrics provided by Jupiter ClimateScore Global are also presented in this report which include the calculation of damage and loss to the asset as well as monetary losses posed by operational and market risks by heat, flooding, wildfire and wind.

PHYSICAL RISK ASSESSMENT

EXPOSURE

Physical exposure data is provided from Jupiter ClimateScore Global. The exposure risk levels for each peril at Zweibrücken Fashion Outlet are as follows:



This graph shows only the **exposure** of the asset to the associated **material hazards**; they do not consider any resilient features or policies in place at the asset.

**Note that whilst wind was not found to be material by Jupiter ClimateScore Global, past events at the centre meant that exposure and vulnerability analyses were conducted in the Appendix Report (Section 4.4) for further verification.*

Any hazards with “medium” or higher exposure along any scenario and time horizon are considered **material**. For Zweibrücken Fashion Outlet, the only hazard of material exposure (at present, or projected under all SSP scenarios through to 2080, is: **Cold**



The location of the asset (Zweibrücken, Germany) means that it is not at material risk of hazards such as earthquakes, hurricanes, tornadoes, volcanoes. As well, the hazards that were analysed and found to be **not material** under any scenario, from present day through to 2080, were:

Wildfire	Heat	Hail
Precipitation	Saline intrusion	Flood
Soil erosion	Solifluction	Landslide
Earthquakes	Volcanoes	Tsunami
Blizzard	Permafrost thawing	Ocean acidification
Wind*	Coastal erosion	Subsidence
Avalanche	Glacial lake outburst	Drought



COLD

The cold peril under Jupiter ClimateScore Global is determined by the days per year below 0°C and the annual heating degree days (90m resolution).

COLD VULNERABLE FEATURES:

- The rural topography surrounding the centre increases the plot's albedo effect
- The main building materials do not guarantee adequate indoor comfort in the presence of cold compared to alternatives
- The centre does not feature thermal curtains or blinds which could serve to reduce the loss of internal heat through glazing
- Buildings with fixtures of U-values greater than 0.30 W/m²K (from phases prior to phase 4) are more vulnerable to cold weather-related hazards as they are relatively worse insulated
- Whilst there are leak detectors for main incoming water pipes, there is no regular water pipe inspection or maintenance protocol

COLD RESILIENT FEATURES:

- Internal heating is present in all buildings onsite and programmable thermostats precisely control the internal temperature of the buildings
- The internal areas of the centre are divided into thermal zones that allow independent control of heating
- All water pipes are located deeper than 80cm below the ground, to ensure that they are not exposed to frost damages
- A relatively appropriate proportion of the centre is glazed, both management and tenant areas; this results in reduced amounts of heat dissipation from internal areas
- The green roof present on top of the restaurant increases the relative thermal insulation of the building

EXPOSURE RISK

Present Day

SSP5-8.5 (2080)

HIGH

MEDIUM

SENSITIVITY RISK

MEDIUM

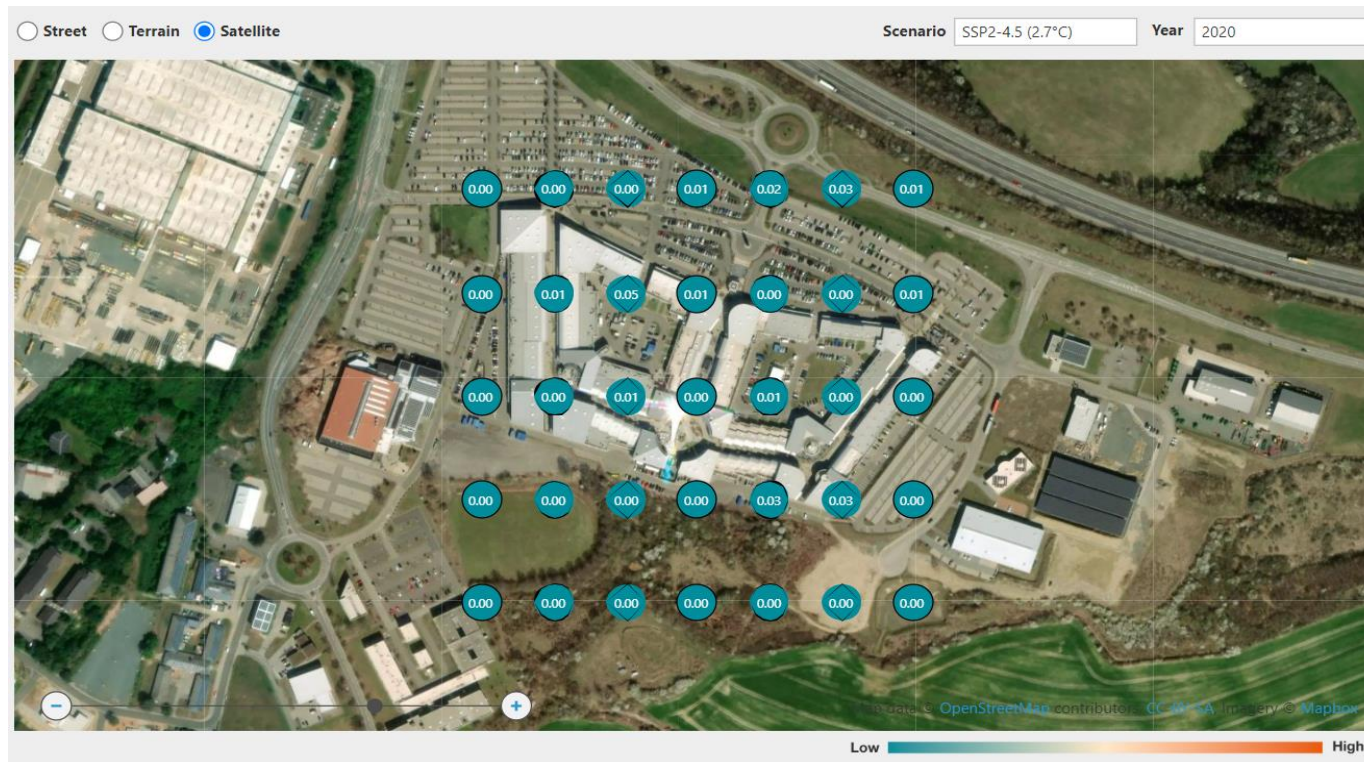
ADAPTIVE CAPACITY-RELATED RISK

MEDIUM



FLOOD

The flood peril under Jupiter ClimateScore Global is given by 200-year flood depth (m) and the flooded fraction (available at up to a 10m resolution).



The flood mesh grid illustrated here represents all flood sources covered by Jupiter ClimateScore Global (fluvial, pluvial and coastal) at the present-day time scenario and under the SSP2-4.5 scenario.

Note that the exposure to these flood sources is **not material** at present or under any SSP scenario from present day through to 2080.

Additionally, no material flood inundation is projected around the centre, so operations are also not exposed to flood.

Physical Overall Risk

The overall risk for each material hazard is summarised in the table below. These ratings are calculated from inputs of 50% exposure and 50% vulnerability, as explained in more depth in the methodology of the Appendix Report.

PERIL	OVERALL RISK LEVEL									
	Present	SSP1-2.6 (2030)	SSP1-2.6 (2050)	SSP1-2.6 (2080)	SSP2-4.5 (2030)	SSP2-4.5 (2050)	SSP2-4.5 (2080)	SSP5-8.5 (2030)	SSP5-8.5 (2050)	SSP5-8.5 (2080)
Cold	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM



TRANSITION RISK ASSESSMENT

POLICY AND REGULATION

The key pieces of national and local legislation relevant to this report's aims which should be considered and aligned to are the following*:

2050 Climate Plan - Klimaschutzplan 2050

Energy Services Act - Energiedienstleistungsgesetz (EDL-G)

Climate Protection Law - Klimaschutzgesetz

Smart Meters

Long-Term Renovation Strategy

Building Energy Act - Gebäudeenergiegesetz (GEG)

EXPOSURE	SENSITIVITY	ADAPTIVE CAPACITY- RELATED RISK	OVERALL RISK
HIGH	MEDIUM	LOW	MEDIUM

Particularly, VIA Outlets should be aware of the 2050 Climate Plan (Klimaschutzplan 2050) and the Long-term Renovation Strategy as their measures have potentially significant implications on existing centres with planned expansions.

Similarly, VIA Outlets should be aware of, and comply with, the Building Energy Act (Gebäudeenergiegesetz), especially regarding renewable energy requirements around new construction.

There are also key building features that impact the sensitivity and adaptive capacity, which include:



Fuel type used for heating



Type of cooling equipment



Installation of renewable energy technology such as PV



Energy performance rating

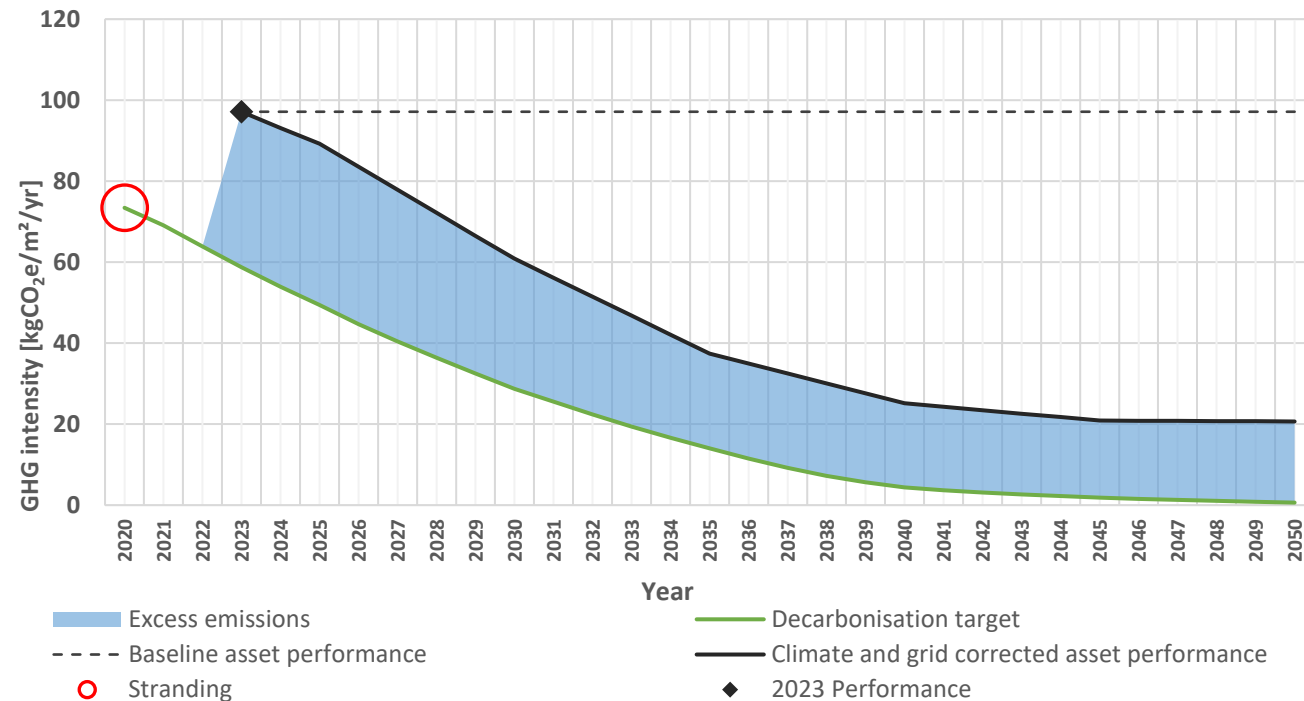


Corporate or asset level targets/policies pertaining to sustainability, green procurement and risk management



Carbon footprinting for scope 1, 2 and 3 emissions

MARKET AND TECHNOLOGY



The preliminary step to reach carbon net-zero is to set annual carbon emission reduction targets which align with national decarbonisation targets for the asset type, as defined by the Paris Agreement in 2015.

These specific targets are illustrated on the following page of this report.

The stranding diagram from CRREM v2 compares the asset's future carbon performance (black line) with the target decarbonisation pathways for Retail, Shopping Centre in Germany (green line).

Based on the 2023 consumption data baseline, Zweibrücken Fashion Outlet is already stranded. This means that it already does not reach the decarbonisation target for greenhouse gas emissions intensity, according to CRREM v2. Please refer to the Appendix Report for a more in-depth understanding of the CRREM Preliminary Analysis.

MARKET	EXPOSURE	SENSITIVITY	ADAPTIVE CAPACITY-RELATED RISK	OVERALL RISK
	HIGHEST	MEDIUM	LOW	HIGH
TECHNOLOGY	EXPOSURE	SENSITIVITY	ADAPTIVE CAPACITY-RELATED RISK	OVERALL RISK
	HIGH	MEDIUM	LOW	HIGH

ACHIEVING CARBON NET-ZERO

Absolute Reduction Targets

	CRREM 2050 1.5°C Trajectory			CRREM 2040 1.5°C Trajectory		
Year	Absolute emissions (kgCO ₂ e/yr)	Intensity Emissions (kgCO ₂ e/m ² /yr)	Percentage target reduction (from 2023 baseline)	Absolute emissions (kgCO ₂ e/yr)	Intensity Emissions (kgCO ₂ e/m ² /yr)	Percentage target reduction (from 2023 baseline)
2023	2,937,663	97.1	0.0%	2,937,663	97.1	0.0%
2025	2,396,284	79.2	18.4%	2,380,228	78.7	19.0%
2030	1,493,984	49.4	49.1%	1,451,168	48.0	50.6%
2035	772,145	25.5	73.7%	707,921	23.4	75.9%
2040	411,225	13.6	86.0%	336,297	11.1	88.6%
2045	230,765	7.6	92.1%	-	-	-
2050	230,765	7.6	92.1%	-	-	-

	CRREM 2050 1.5°C Trajectory			CRREM 2040 1.5°C Trajectory		
Year	Absolute emissions (kWh/yr)	Intensity Emissions (kWh/m ² /yr)	Percentage target reduction (from 2023 baseline)	Absolute emissions (kWh/yr)	Intensity Emissions (kWh/m ² /yr)	Percentage target reduction (from 2023 baseline)
2023	8,531,628	282.0	0.0%	8,531,628	282.0	0.0%
2025	6,893,945	227.9	19.2%	6,957,792	230.0	18.4%
2030	3,686,815	121.9	56.8%	3,875,697	128.1	54.6%
2035	3,686,815	121.9	56.8%	3,875,697	128.1	54.6%
2040	3,686,815	121.9	56.8%	3,875,697	128.1	54.6%
2045	3,686,815	121.9	56.8%	-	-	-
2050	3,686,815	121.9	56.8%	-	-	-

The targets used in this assessment are from the CRREM v2 pathways

The preliminary step to reach carbon net-zero is to set annual carbon emission reduction targets which align with national decarbonisation targets for the asset type, as defined by the Paris Agreement in 2015.

The first table proposes the absolute Greenhouse Gas targets for two decarbonisation scenarios for Zweibrücken Fashion Outlet from a baseline 2023 value of 97.1 kgCO₂e/m²/yr, using a location-based emission analysis.

The percentage reductions from the baseline emissions level in 2019 are stated. The scenarios presented are:

1. To be aligned to the CRREM 1.5°C trajectory by 2050.
2. To be aligned to Net Zero by 2040.

The second table maps the same potential scenario pathways for absolute energy reduction targets for the asset from a baseline 2023 value of 282 kWh/m²/yr.

REPUTATION RISK







The reputation risk outlines the risks associated with the changing markets and user preferences due to the transition to a low carbon economy and highlights current trends and the impacts these could have on Zweibrücken Fashion Outlet.

Trends	Reputation Analysis	Exposure	Vulnerability	Overall Risk
Consumer Preferences and Demands	As awareness of climate change and environmental issues grows, consumers are increasingly looking for sustainable and eco-friendly products. This shift in consumer values has led to a demand for sustainable and responsibly sourced goods.	HIGH	HIGH	HIGH
Brand Reputation	Consumer and stakeholder values are increasingly tied to the environmental practices of retailers. Brands that are seen as environmentally responsible often have a competitive advantage. Conversely, companies with a poor environmental track record can face backlash, boycotts, and reputational damage.			
Regulatory Pressure	Governments are implementing stricter environmental regulations and emissions standards to combat climate change. Retailers must adhere to these regulations, which often entail additional costs and operational changes. Non-compliance can result in fines and reputational damage, which can negatively impact a retailer's bottom line and stakeholder trust.			
Product Innovation	To meet consumer demands for eco-friendly products, retailers should invest in research and development to create more sustainable items. This may involve using recycled materials, reducing packaging, and exploring alternative energy sources for stores.			
Investor Expectations	Shareholders and investors are increasingly incorporating environmental, social, and governance (ESG) factors into their investment decisions. Retail companies that don't demonstrate a commitment to sustainability may find it harder to attract investment or may face divestment from ESG-focused funds.			
Demand For Transparency	Stakeholders and consumers demand transparency regarding a company's environmental practices.			

SOCIAL IMPLICATIONS

SOCIAL IMPACT ASSESSMENT

Climate-related risks can create social implications for and surrounding the asset. These implications can affect the economic stability, safety and well-being of individuals and communities, as well as the financial performance and sustainability of real estate assets. Such implications are listed below.

Category		Social Implication
	Health	<ul style="list-style-type: none"> ➤ Increased morbidity and mortality ➤ Vector-borne diseases
	Tenant Disruption	<ul style="list-style-type: none"> ➤ Displacement and migration ➤ Industry disruptions
	Economic Inequality	<ul style="list-style-type: none"> ➤ Access to affordable buildings ➤ Increased costs
	Social Inequality	<ul style="list-style-type: none"> ➤ Vulnerability of marginalised groups
	Social Disruption	<ul style="list-style-type: none"> ➤ Divestment campaigns ➤ Social movements ➤ Community resistance
	Service Disruption	<ul style="list-style-type: none"> ➤ Networks and Resources
	Strategic Shifts	<ul style="list-style-type: none"> ➤ Training and awareness



Material Implications

- Health and safety
- Social Disruption
- Service Disruption
- Strategic Shifts

COMMUNITY ENGAGEMENT

Addressing the social implications of physical and transition climate risks in real estate requires a collaborative approach among all stakeholders. This involves integrating climate resilience and sustainability into planning and investment decisions, prioritising the well-being of building occupiers and the community, and ensuring that adaptation and transition efforts are equitable and inclusive.

Community Engagement at Zweibrücken Fashion Outlet

- Introduce questionnaires or discussion with community members to understand their values and what they believe should be done to improve Zweibrücken Fashion Outlet's resilience to climate change.
- Implement protocols in which Zweibrücken Fashion Outlet can be used to serve the local community, addressing reputational risks associated with the asset.
- Response measures including emergency evacuation plans should be accessible and consideration should be given to individuals with disabilities or mobility issues, ensuring they have the necessary assistance during an evacuation.
- Consider use of the asset as a community refuge space for emergencies, including as a cooling centre during heatwaves or as a shelter during extreme weather events, if the asset has sufficient adaptation measures, training and policies in place to do so.
- Foster engagement with existing local climate initiatives, such as the Saarbrücken Sustainability Strategy

FINANCIAL RISK ASSESSMENT

FINANCIAL IMPACT ASSESSMENT

Climate-related risks can have severe financial implications on the asset. A financial assessment was conducted as a factor of the identified risks at the asset to determine the degree of material impact on the asset, its operations and financial planning thereafter. In Jupiter ClimateScore Global, economic impact metrics are calculated based on the perils of wind, flood, heat and wildfire. Zweibrücken Fashion Outlet is not at material exposure to any of these perils, according to Jupiter ClimateScore Global analysis. Therefore, the asset has no financial risk to climate hazards and so no financial damage and loss modelling has been undertaken. The centre, however, should be aware of a potential increase in operating costs due to colder temperatures and an increase in heating requirements to counteract this.



Impacts due to Physical Risk



Potential for increased insurance costs or reduced insurance availability.



Increased operating costs due to need for increased resources (energy/water) to adapt to changing climates.



Potential business disruption due to damages to assets and physical property caused by extreme events.



Costs to repair damaged assets or increased maintenance costs from wear and tear.



Employee injury or illness causing increased health costs and reduced business costs due to time taken off work.



Investment into new systems to ensure safe and comfortable working conditions under increasingly stressed climate conditions.



Impacts due to Transition Risk



Reduced economic activity in vulnerable markets.



Reduced occupier demand for properties.



Reduced asset value.



Risk to company brand and reputational damages from negative stakeholder feedback if no action is taken.



Lower liquidity and reduced attractiveness of assets of assets without climate risk reduction measures.



Increased cost of business due to compliance measures.



Increased taxes from climate policies such as carbon taxes.



Increased costs of resources such as energy and water.



Investment into community engagement and climate initiatives.



Investment costs into new low-carbon infrastructure and systems.

AREAS OF VULNERABILITY

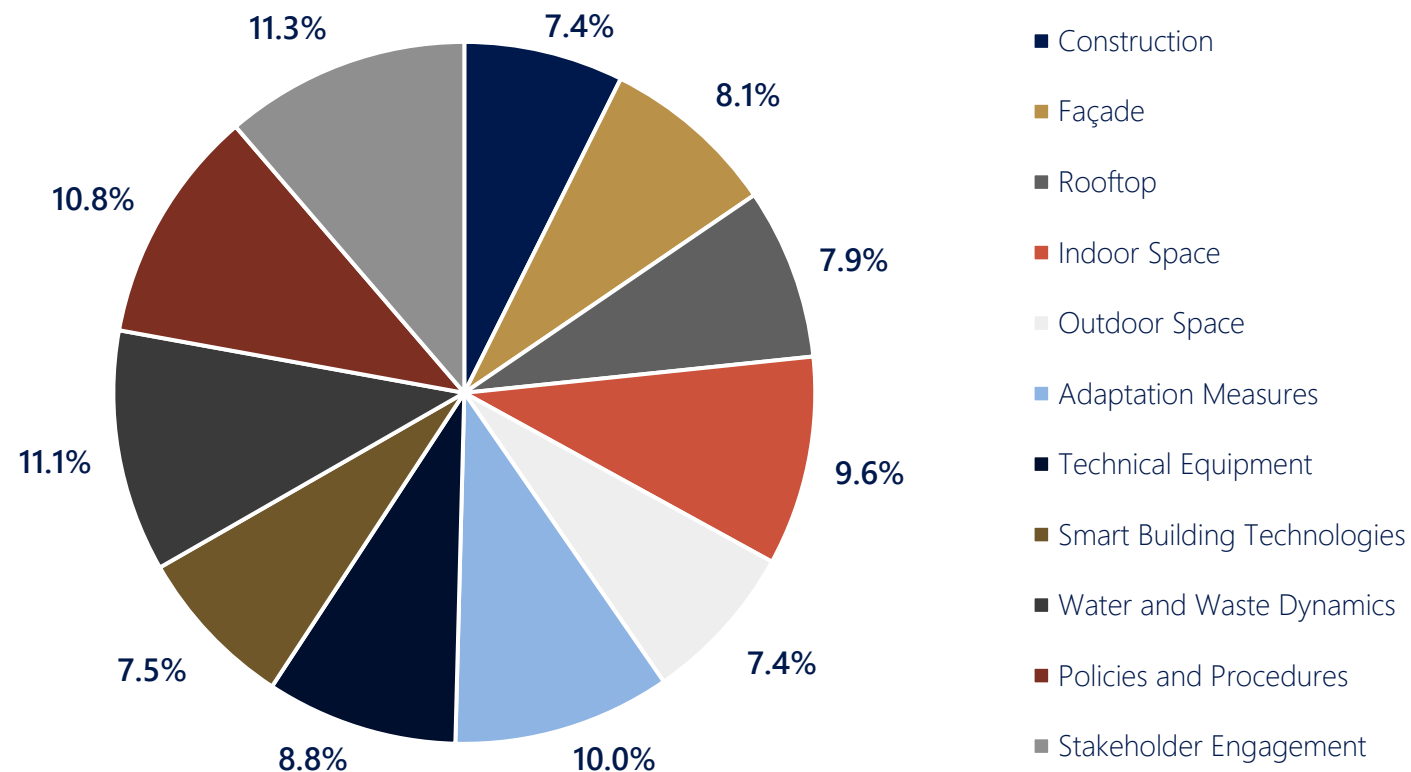
The table below highlights the potential risk evolution per financial stream and risk through to 2080. To mitigate against these increases and avoid costs for repair or higher premiums on insurance, it is essential to adapt to the risks identified in this report as early as possible through the recommended risk reduction measures. As specified in the table, the overall risk for most streams is classified as “**medium**”. Therefore, it is perceivable that by not implementing risk reduction measures, risk may increase by 2080 along each of the SSP scenarios. Identified financial risks can be managed through undertaking investment in cost-effective climate resilience solutions and technologies, compliance with best-practice climate risk management strategies, and meeting consumer and stakeholder demands.

RISKS AT PRESENT	Physical: Acute	Physical: Chronic	Transition: Policy and Legal	Transition: Market	Transition: Technology	Transition: Reputational
Increased Operating Costs	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	
Asset write offs	LOW	LOW				
Reduced demand for asset products and services	MEDIUM	MEDIUM	MEDIUM	LOW	MEDIUM	MEDIUM
Capital investments in technology	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	
Adaptation costs	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	
Shifts in energy costs	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	
Repricing of assets	LOW	LOW	MEDIUM	LOW	MEDIUM	
Reduced revenue - workforce	MEDIUM	LOW	MEDIUM	MEDIUM	MEDIUM	MEDIUM
Reduction in Capital Availability	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	
Overall	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM

VULNERABILITY OF ZONES

Further to the financial streams, the graph below indicates the most vulnerable elements of the building per material risk and where remediation and resiliency enhancement should be focused.

Evidently, the three zones of significant relative vulnerability are stakeholder engagement (11.3%); water and waste dynamics (11.1%); and policies and procedures (10.8%). It is therefore Longevity Partner's advice to focus, where possible, on these zones when considering phased action on the recommendations of this report.



CONCLUSION

SUMMARY OF RISKS

The overall risk for each material hazard is summarised in the table below. These ratings are calculated from inputs of 50% exposure and 50% vulnerability, as explained in more depth in the methodology of the appendix report.

PERIL	OVERALL RISK LEVEL									
	Present	SSP1-2.6 (2030)	SSP1-2.6 (2050)	SSP1-2.6 (2080)	SSP2-4.5 (2030)	SSP2-4.5 (2050)	SSP2-4.5 (2080)	SSP5-8.5 (2030)	SSP5-8.5 (2050)	SSP5-8.5 (2080)
Cold	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM
Policy and Legal	MEDIUM									
Market	HIGH									
Technology	HIGH									
Reputation	HIGH									

The asset is projected to be at significant exposure to the physical hazard of **cold** only. In order to ascertain the full extent of the resilience of the asset to these physical hazards, a vulnerability assessment was conducted. This determined the overall risk levels illustrated in this table.

The table also shows the overall risk relating to **transition (policy and legal; market; technology and reputation)**.

The combination of these risks could lead to the following key aspects of the building being impacted:

1. Exterior wall materials and insulation
2. Windows and glazing systems
3. HVAC (Heating, Ventilation, and Air Conditioning) systems
4. Water supply and plumbing infrastructure
5. Landscaping and vegetation around the building
6. Building envelope integrity and air leakage
7. Energy efficiency of the building
8. Interior comfort and air quality

RECOMMENDATIONS

A risk reduction plan should be implemented based on the identified significant climate risks which, to date, do not have sufficient risk reduction measures installed to mitigate the risk (as determined by the vulnerability analyses). The key recommendations to be focussed on are listed below, with a wider list of recommendations, including indicative costs, provided the appendix of this presentation and additional recommendations available in the Appendix Report.

Install thermal blinds or curtains

Increases the thermal capacity of internal areas. Specifically, management offices and the large meeting room.

*Cold
Reputation*

Make the most of the extensive available roof spaces

Look into the feasibility of installing more green roofs in addition to the planned additional PV installations. Also, wind monitoring systems could be installed.

*Cold
Policy and Legal
Reputation
Wind*

Investigate the feasibility of phasing out fossil fuels and refrigerants with high GWPs

Assess the feasibility of switching to centralised electric heating systems and using systems with more environmentally friendly refrigerants for cooling (with GWPs of less than 10).

*Policy and Legal
Market
Technology
Reputation*

Install drinking water facilities on site

Install publicly available and accessible drinking water dispensers around the site.

Reputation

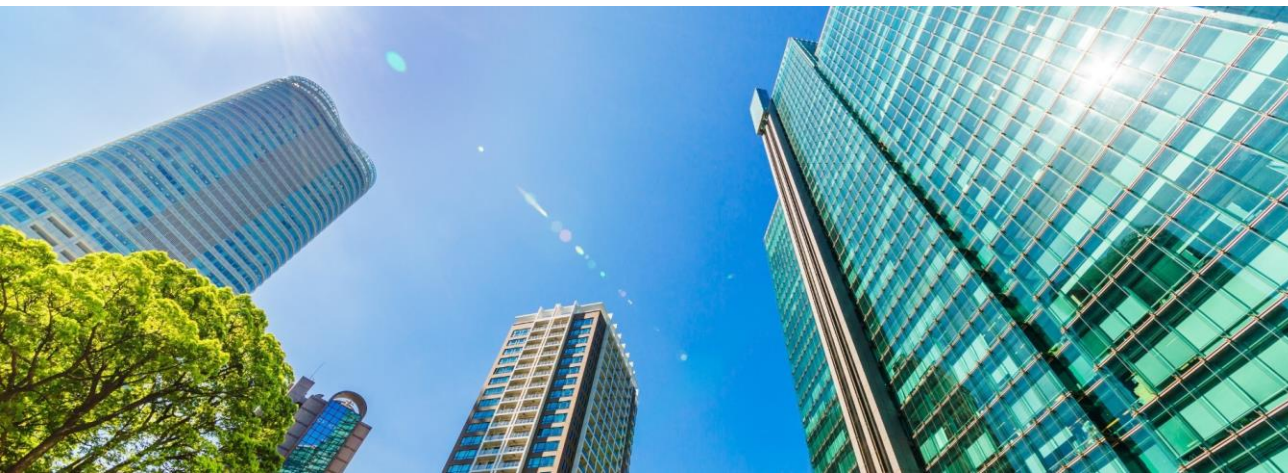
RISK REDUCTION PLAN

Climate Risk	Overall Risk Present	Overall Risk where Measures are Implemented	Risk Reduction
Cold	54%	51%	3%

Assuming all the risk reduction measures are implemented, the difference in potential physical risk is outlined in this table. Please refer again to the percentages associated with each risk level. Note that each climate risk only has scope to be controlled according to the adaptive capacity related risk. This means that the potential overall risk will only reduce to a certain degree due to the inherent sensitivity risk of the asset due to its location and core construction features.

There are already multiple features and policies in place at Zweibrücken Fashion Outlet which increase its resilience against cold weather. Therefore, the potential for a quantitative reduction in risk is minimal while the real reduction in vulnerability of the centre could be significant.

In line with of all risk reduction measures being implemented, this table demonstrates the potential risk change, at present, from transition risks.



Climate Risk	Overall risk present	Overall risk after measures are implemented	Risk reduction
Policy and Legal	54%	49%	5%
Market	66%	61%	5%
Technology	61%	39%	22%
Reputation	63%	51%	12%

APPENDICES

HARD RECOMMENDATIONS

As well as the key five recommendations, all measures recommended in the appendix report have been separated into “hard” measures, which will require significant retrofit or installations within the asset and will likely require external support, and “soft” measures which are much easier to implement and can often be managed internally in the tables below. It is recommended that high priority measures are implemented first where possible.

HARD Recommendations	Priority	Risk reduction measures	Indicative costs	Risk addressed	Impact
	HIGHEST	Install thermal curtains or blinds to management areas	Thermal Curtains: €50-250	Cold, Reputation	Reduces the potential for heat losses during cold periods, especially at night.
	HIGH	Install more green roofs on site	€40-60 per square metre	Cold, Policy and Legal, Reputation	Serve to increase the effective insulation of the buildings.
	HIGH	Install drinking water dispensers around the centre	€200-500 per unit	Reputation	Increases the resilience of centre users to dehydration and increases the user perception of visitor wellbeing importance at the centre.
	MEDIUM	Retrofit double glazing with triple glazing (via a phased replacement and procurement policy)	€400-500 per square metre	Cold, Market, Technology	Reduces potential heat losses through glazing.
	MEDIUM	Ensure that cooling systems in future expansions are sized appropriately for future climate scenarios	Internal Resourcing	Market, Technology	Reduces transition risk associated with such systems.
	LOW	Install energy saving overrides (timers) to management area's internal lighting	Internal Resourcing via BMS	Market, Technology	Decreases potential energy wasting from lights accidentally being left on overnight.
	LOW	Retrofit all bicycle storage installations at the centre to ensure that they are compliant with BREEAM in-Use requirements	Further Investigation Required	Reputation	Improves the facilities for users to not rely on cars to travel to the centre, reducing the centre's scope 3 emissions.
	LOW	Look into installing a battery storage for the PV installations	Further Investigation Required regarding feasibility and size	Policy and Legal, Market, Technology	Reduces relative costs due to German grid buy and sell discrepancies.
	LOW	Install localised wind monitoring systems with capacity to warn tenants of potential damaging winds	€100-150 per unit and connection to BMS	Wind	Could prevent extensive damage to buildings and disruption to operations.
	LOW	Install windbreak mechanisms such as wind screens or baffles	€10-30 per unit	Wind	Reduce impacts of strong winds on buildings and users at ground level.

SOFT RECOMMENDATIONS





As well as the key five recommendations, all measures recommended in the appendix report have been separated into “hard” measures, which will require significant retrofit or installations within the asset and will likely require external support, and “soft” measures which are much easier to implement and can often be managed internally in the tables below. It is recommended that high priority measures are implemented first where possible.

SOFT Recommendations	Priority	Risk reduction measures	Indicative costs	Risk addressed	Impact
	HIGH	Assess the feasibility of switching to an electric heating system with a renewable energy source	Further Investigation Required (specific Energy Audit – Longevity Partners can assist with this)	Policy and Legal, Market, Technology	Reduces the GHG emissions and consumption from the centre.
	HIGH	Assess the feasibility of phased replacement of current cooling systems for ones which utilise low GWP (less than 10) refrigerants	Further Investigation Required (specific Energy Audit – Longevity Partners can assist with this)	Policy and Legal, Market, Technology, Reputation	Reduces the reliance of the centre on potent greenhouse gases which negatively impact the climate.
	HIGH	Participate in discussions with local, relevant bodies regarding the use of the centre as a refuge point during extreme events (e.g. The May 2024 floods in Zweibrücken)	Internal Resourcing	Reputation	Improves the public perception of the centre and VIA Outlets and decreases the local area's vulnerability to such events
	MEDIUM	Implement regular, proactive inspection and maintenance of water pipes	Internal Resourcing	Cold	Allows for potential damages from frost and freezing to be identified before they can become catastrophic.
	MEDIUM	Utilise smart technologies to track the grid	Internal Resourcing	Market, Technology	Allows for cost savings as energy can be purchased at cheaper times.
	LOW	Investigate creating a document which educates tenants on physical, transition and social climate-related risks to their unit and operations	Internal Resourcing	Policy and Legal, Reputation	Can decrease the impact of tenants on the environment and increase their resilience against climate change-related hazards.
	LOW	Look into implementing grid balancing technology	Further Investigation Required regarding feasibility	Policy and Legal, Market, Technology	Works to make the EV charging systems more efficient and therefore reduces costs of energy.
	LOW	Implement a policy whereby tenants must close doors and not have equipment outside when winds are stronger than a certain threshold	Internal Resourcing	Wind	Could prevent extensive damage to buildings and disruption to operations.
	LOW	Conduct a leakage test to verify the resistance of the building to high pressures of wind	€50-60 per test (multiple needed for such a large centre)	Wind	Identify areas at risk which would benefit from additional protection measures.

PLANNED REFURBISHMENT RECOMMENDATIONS

Refurbishment works are to be carried out at Zweibrücken Fashion Outlet in late 2024 and 2025, featuring a southern expansion featuring approximately 40 additional tenanted units. Additional PV panels installations are planned over existing and new buildings and no major implications are expected at the existing centre.

Particular elements of the refurbishment that need to be considered for their climate resilience impact include:

	Planned Feature	Material Risk	Recommendation
	Façade	Cold	For updates to façades, ensure that glazed proportion is low so that limited internal heat can be lost through thermal transmittance.
	Vegetation coverage	Cold	Enhance vegetation to increase thermal protection of the centre and its users to cold weather and wind.
	Windows	Cold	Where windows are installed, glazing could be updated to triple glazing. Minimising the glazing is the most effective way to manage cold-related hazards.
	Awnings and Balconies	Wind Stress	Ensure new awnings and balconies provide sufficiently strong to protect from potentially significant winds.
	New construction general	Market and Policy Transition Risk	Ensure new buildings adhere to the Building Energy Act (Gebäudeenergiegesetz), especially regarding renewable energy requirements around new construction.

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